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| EXAMINER | |
|---|---|
| REDDY, KARUNA P | |
| **ART UNIT** | **PAPER NUMBER** |
| 1796 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/586,134 | MICHL ET AL. | |
| | Examiner | Art Unit | |
| | Karuna P. Reddy | 1796 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *10-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. This office action is in response to the amendment filed on 11/8/ 2007. Applicant amended claims 10-18; cancelled claims 1-9; and added claim 19. Claims 10-19 are currently pending in the application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 12 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the

application was filed, had possession of the claimed invention. Claim 12 recites "double bond" (lines 3-4) and the recitation is not supported by specification as originally filed.

6. Claim 10 recites the limitation "the multifunctional monomer" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claims 11-19 are subsumed by the rejection of claim 10.

***Claim Rejections - 35 USC § 103***

7. Claims 10-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rockrath et al (US 6, 835, 420 B1).

It is noted that WO 01/12736 (WO) is being utilized for date purposes. However, in the discussion below the US equivalent for WO, namely, Rockrath et al (US 6, 835, 420 B1) is referred to in the body of the rejection below. All column and line citations are to the US equivalent.

Rockrath et al disclose a binding agent comprising two functional groups which can enter into crosslinking reactions with complimentary functional groups in crosslinking agent. The binding agent has at least one olefinically unsaturated polysiloxane macromonomer which contains at least 3.0 double bonds per molecule (abstract). The polysiloxane macromonomers have a number average molecular weight of from 2000 to 30,000 (column 6, lines 64-67; column 7, line

1). The olefinically unsaturated double bonds of the polysiloxane macromonomers for inventive use are present in acrylic, methacrylic, vinyl, and/or allyl groups (column 7, lines 21-22). The monomer mixture is polymerized with one or more polymerization initiators (column 10, lines 61-63) and includes dialkyl peroxides, t-butyl perethylhexanoate and azobisisobutyronitrile (column 11, lines 5-11). Suitable substrates include fiber composites, glass fibers and rock wool (column 19, lines 33-40). See example 1, wherein the coating composition comprises hexaacrylate-functional polysiloxane macromonomer and initiator solution of t-butyl perethylhexanoate (column 24, lines 16-44).

Rockrath et al fails to exemplify contacting fibrous and/or granular substrates with polymerization reaction mixture.

However, Rockrath et al teach in the general disclosure coating of substrates such as glass fibers, glass wool and rock wool (column 19, lines 33-40). Therefore, it would have been obvious to coat the substrate with polymerizable mixture of Rockrath et al, because Rockrath et al teaches coating a substrate such as glass fibers, glass wool, rock wool, as well as the polymerization of coating material and one of ordinary skill in the art would expect the polymerization to work after coating the substrate with polymerizable mixture.

8. Claims 10-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baumgart et al (US 6, 534, 185 B1).

It is noted that WO 00/26309 (WO) is being utilized for date purposes. However, in the discussion below the US equivalent for WO, namely, Baumgart et al (US 6, 534, 185 B1) is referred to in the body of the rejection below. All column and line citations are to the US equivalent.

Baumgart et al disclose a coating composition containing at least one polysiloxane macromonomer as binder (abstract). Suitable polysiloxane macromonomers are those having a molecular weight of from 1,000 to 40,000 (column 4, lines 53-55). Examples of macromonomers include acryloxysilane containing vinyl monomers having ethylenically unsaturated double bond content (column 4, lines 64-67). The coating composition can be used in the field of coating of furniture and industrial coating (column 8, lines 31-34). It is possible to use substrates of glass, wood (column 8, lines 51-53). Examples of suitable polymerization initiators are those which form free radicals such as tert-butyl peroxyethyl hexanoate, benzoyl peroxide and azobisiso-butyronitrile. The initiators are used preferably in an amount of from 2 to 25% by weight (column 6, lines 39-45).

Baumgart et al fails to exemplify contacting fibrous and/or granular substrates with polymerization reaction mixture.

However, Baumgart et al teach in the general disclosure coating of substrates such as glass, wood, plastic or metal (column 19, lines 33-40). Therefore, it would have been obvious to coat the substrate with polymerizable mixture of Baumgart et al, because Baumgart et al teaches coating a substrate

such as glass, wood, plastic or metal, as well as the polymerization of coating material and one of ordinary skill in the art would expect the polymerization to work after coating the substrate with polymerizable mixture.

9. Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arkens et al (US 5, 661, 213).

Arkens et al disclose aqueous coating composition containing a polyacid and a polyol. The composition may be used as a binder for heat resistant nonwovens such as fiber glass (abstract). The addition polymer must contain at least two carboxylic acid groups such as (meth)acrylic acid, anhydride groups or salts thereof (column 4, lines 1-2) and read on the one or more free radically polymerizable double bonds. The polyol may be a compound with a molecular weight less than about 1000 bearing at least two hydroxyl groups such as ethylene glycol, glycerol, 1,4-cyclohexane diol (column 6, lines 1-6). The addition polymer containing at least two carboxylic acid groups may have a molecular weight preferably from about 10,000 to 100,000 (column 4, lines 28-29). The polymerization reaction may be initiated by using the thermal decomposition of an initiator to generate free radicals to effect polymerization (column 5, lines 6-11). In one embodiment, the addition polymer would contain both carboxyl, anhydride or salts thereof functionality and hydroxyl functionality (column 6, lines 61-65). The curable aqueous composition may be used as a binder for heat resistant nonwoven fabrics such as certain polyester fibers, rayon fibers and

glass fibers (column 8, lines 24-29). The heat resistant nonwovens may be used for applications such as insulation batts or rolls, as reinforcement scrim in cementitious and non-cementitious coatings for masonry (column 8, lines 61-67).

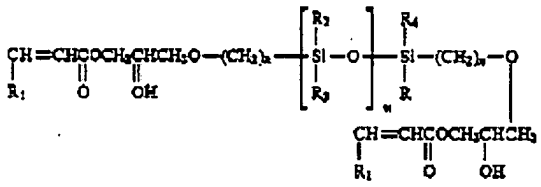
Arkens et al fails to exemplify contacting fibrous and/or granular substrates with polymerization reaction mixture.

However, Arkens et al teach in the general disclosure use of curable aqueous composition as a binder for heat resistant nonwoven fabrics such as certain polyester fibers, rayon fibers and glass fibers and polymerization of the reaction mixture. Therefore, it would have been obvious to coat the substrate with polymerizable mixture of Arkens et al, because Arkens et al teaches coating a substrate such as certain polyester fibers, rayon fibers and glass fibers, as well as the polymerization of the binder material and one of ordinary skill in the art would expect polymerization to work after coating the substrate with polymerizable mixture.

10. Claims 10-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Engelke et al (US 5, 686, 531) in view of Rockrath et al (US 6, 835, 420 B1).

It is noted that WO 01/12736 (WO) is being utilized for date purposes. However, in the discussion below the US equivalent for WO, namely, Rockrath et al (US 6, 835, 420 B1) is referred to in the body of the rejection below. All column and line citations are to the US equivalent.

Engelke et al disclose a coating agent comprising a binding agent containing at least one acrylate copolymer (A) with carboxyl group and/or at least one acrylate copolymer (B) with epoxide groups being obtained by solution polymerization of polysiloxane macromonomers having a number average molecular weight of 1,000 to 40,000 and an average 0.5 to 2.5 ethylenically unsaturated double bonds per molecule (abstract). The polysiloxane macromonomers of the following formula are preferably employed and read



on the free radically polymerizable groups of claim 12. Suitable free radical initiators are organic peroxides, aliphatic azo compounds. The amount of initiator in most cases is 0.1 to 15% by weight based on the amount of monomer to be processed (column 10, line 62; column 11, lines 7-10).

Engelke et al is silent with respect to contacting fibrous and/or granular substrates with polymerization reaction mixture.

However, Rockrath et al disclose a binding agent comprising at least one olefinically unsaturated polysiloxane macromonomer which contains at least 3.0 double bonds per molecule (abstract). The polysiloxane macromonomers have a number average molecular weight of from 2000 to 30,000 (column 6, lines 64-67; column 7, line 1). The olefinically unsaturated double bonds of the

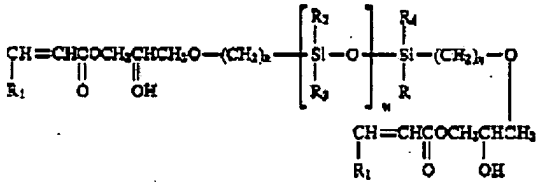
polysiloxane macromonomers for inventive use are present in acrylic, methacrylic, vinyl, and/or allyl groups (column 7, lines 21-22). The monomer mixture is polymerized with one or more polymerization initiators (column 10, lines 61-63) and include dialkyl peroxides, t-butyl perethylhexanoate and azobisisobutyronitrile (column 11, lines 5-11). Suitable substrates include fiber composites, glass fibers and rock wool (column 19, lines 33-40). Therefore, it would have been obvious to contact fibrous and/or granular substrates such as fiber composites, glass fibers and rock wool with the polymerizable mixture of Engelke et al because, the polymerizable mixture of Engelke et al is substantially similar to that of Rockrath et al and Rockrath et al has proven successfully that the coating composition can be used to coat fibrous and/or granular substrates such as fiber composites, glass fibers and rock wool and one of ordinary skill in the art would expect the polymerization of polymerizable mixture, of Engelke et al to work on the surface of a fibrous and/or granular substrate, motivated by expectation of success.

11. Claims 10-14 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Engelke et al (US 5, 686, 531) in view of Baumgart et al (US 6, 534, 185 B1).

It is noted that WO 00/26309 (WO) is being utilized for date purposes. However, in the discussion below the US equivalent for WO, namely, Baumgart

et al (US 6, 534, 185 B1) is referred to in the body of the rejection below. All column and line citations are to the US equivalent.

Engelke et al disclose a coating agent comprising a binding agent containing at least one acrylate copolymer (A) with carboxyl group and/or at least one acrylate copolymer (B) with epoxide groups being obtained by solution polymerization of polysiloxane macromonomers having a number average molecular weight of 1,000 to 40,000 and an average 0.5 to 2.5 ethylenically unsaturated double bonds per molecule (abstract). The polysiloxane macromonomers of the following formula are preferably employed and read



on the free radically polymerizable groups of claim 12. Suitable free radical initiators are organic peroxides, aliphatic azo compounds. The amount of initiator in most cases is 0.1 to 15% by weight based on the amount of monomer to be processed (column 10, line 62; column 11, lines 7-10).

Engelke et al is silent with respect to contacting fibrous and/or granular substrates with polymerization reaction mixture.

However, Baumgart et al teach a coating composition containing at least one polysiloxane macromonomer as binder (abstract). Suitable polysiloxane macromonomers are those having a molecular weight of from 1,000 to 40,000

(column 4, lines 53-55). Examples of macromonomers include acryloxysilane containing vinyl monomers having ethylenically unsaturated double bond content (column 4, lines 64-67). The coating composition can be used in the field of coating of furniture and industrial coating (column 8, lines 31-34). It is possible to use substrates of glass, wood and metal (column 8, lines 51-53). Examples of suitable polymerization initiators are those which form free radicals such as tert-butyl peroxyethyl hexanoate, benzoyl peroxide and azobisiso-butyronitrile. The initiators are used preferably in an amount of from 2 to 25% by weight (column 6, lines 39-45). Therefore, it would have been obvious to contact fibrous and/or granular substrates such as glass, wood and metal with the polymerizable mixture of Engelke et al because, the polymerizable mixture of Engelke et al is substantially similar to that of Baumgart et al and Baumgart et al has proven successfully that the coating composition can be used to coat fibrous and/or granular substrates such as glass, wood, metal and one of ordinary skill in the art would expect the polymerization of the polymerizable mixture, of Engelke et al, to work on the surface of a fibrous and/or granular substrate, motivated by expectation of success.

12. Claims 15-16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arkens et al (US 5, 661, 213) in view of Rockrath et al (US 6, 835, 420 B1).

The discussion with respect to Arkens et al in paragraph 10 above is incorporated herein by reference. Furthermore, the composition can comprise a

polyacid containing at least two carboxylic acid groups or the salts thereof and a highly reactive polyol containing at least two hydroxyl groups wherein the ratio of the number of equivalents of said carboxylic groups, anhydride groups or salts thereof to the number of equivalents of said hydroxyl groups is from about 1/0.01 to about 1/3 (column 7, lines 18-26) and reads on the percentages of claim 15.

Arkens et al is silent with respect to reacting the product obtained with at least one epoxy compound and subsequently reacting with polyisocyanate.

However, Rockrath et al teach binding agent comprising two functional groups which can enter into crosslinking reactions with complimentary functional groups in crosslinking agent. The binding agent has at least one olefinically unsaturated polysiloxane macromonomer which contains at least 3.0 double bonds per molecule (abstract). For thermally sensitive substrates it is advantageous to choose a temperature range which does not exceed $100^0$C. In view of these temperature conditions, hydroxyl groups and isocyanate groups or carboxyl and epoxy groups have proven advantageous as complimentary functional groups (column 8, lines 54-59). The coating material may comprise at least one reactive diluent curable thermally and/or with actinic radiation (column 16, lines 35-37). Examples of reactive diluents include hydroxyethyl (meth)acrylate (column 17, lines 18-35) and read on the chain extender of claim 19. Therefore, it would have been obvious to one skilled in the art at the time invention was made to add polyisocyanate as a crosslinking agent to the binder of Arkens et al after reacting with epoxy crosslinker to cure the binder at low

temperatures because the binder of Arkens et al comprises both carboxyl and hydroxyl groups and Rockrath et al have proven successfully that carboxyl and epoxy or hydroxyl and isocyanato are advantageous as complimentary functional groups in the binder for curing at low temperatures and one of ordinary skill in the art would expect such crosslinkers to work for the binder of Arkens et al, motivated by expectation of success.

13. Claim 10 and 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al (US 5, 096, 938).

Beck et al disclose a radiation curable catalyst by reacting a) 1 equivalent of a dihydric to hexahydric oxyalkylated $C_2$-$C_{10}$ alcohol with b) from 0.05 to 1 equivalent of a dibasic to tetrabasic $C_3$-$C_{36}$ carboxylic acid or its anhydride and c) from 0.1 to 1.5 equivalents of acrylic acid and/or methacrylic acid and reacting the excess carboxyl groups with an equivalent amount of epoxide compound (abstract). To avoid premature polymerization, the esterification is advantageously carried in the presence of small amounts of inhibitors (column 2, lines 66-68). It is noted that, phenothiazine listed as a polymerization inhibitor is known to function as polymerization initiator[1]. After esterification, the carboxyl groups of the acrylate resin and the excess acrylic acid or methacrylic acid are reacted with epoxide compounds (column 3, lines 14-21).

[1] JP 60-163914 of Fujioka et al is included as a reference to the use of phenothiazine as a polymerization initiator (abstract).

Beck et al is silent with respect to the use of coating composition on fibrous or granular substrates.

However, Beck et al's binder is generic to all coatings. Furthermore, for economical processability, in general low raw material and high reactivity are important with regard to the binder (column 1, lines 26-27). For economical processability, in general low raw material costs and high reactivity are important with regard to the binder, as well as a low requirement of reactive diluent for obtaining suitable processing viscosities (column 1, lines 26-30). The object of this invention is to provide coating materials which have substantially lower contents of volatile and physiologically unacceptable acrylic compounds, whose requirement of reactive diluents is very low and which can be processed to give high quality coatings (column 1, lines 60-66). Therefore, it would have been obvious to esterify the reaction mixture after coating the substrate such as fibrous and/or granular substrates, because Beck et al teaches both esterification and generic use of the product as a binder in coatings comprising low content of volatile and physiologically unacceptable acrylic compounds, with suitable processing viscosities that can be processed to give high quality coatings.

14. Claims 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beck et al (US 5, 096, 938) in view of Rockrath et al (US 6, 835, 420 B1).

The discussion with respect to Beck et al in paragraph 12 is incorporated herein by reference.

Beck et al differs in the curing mechanism and chain extender.

However, Rockrath et al teach binding agent comprising two functional groups which can enter into crosslinking reactions with complimentary functional groups in crosslinking agent. The binding agent has at least one olefinically unsaturated polysiloxane macromonomer which contains at least 3.0 double bonds per molecule (abstract). For thermally sensitive substrates it is advantageous to choose a temperature range which does not exceed 100$^0$C. In view of these temperature conditions, hydroxyl groups and isocyanate groups or carboxyl and epoxy groups have proven advantageous as complimentary functional groups (column 8, lines 54-59). The coating material may comprise at least one reactive diluent curable thermally and/or with actinic radiation (column 16, lines 35-37). Examples of reactive diluents include hydroxyethyl (meth)acrylate (column 17, lines 18-35) and read on the chain extender of claim 19. Therefore, it would have been obvious to one skilled in the art at the time invention was made to add polyisocyanate as a crosslinking agent to the binder of Beck et al to cure the binder at low temperatures because the binder of Beck et al comprises hydroxyl groups in addition to carboxyl groups and Rockrath et al have proven successfully that hydroxyl and isocyanato are advantageous as complimentary functional groups in the binder for curing at low temperatures and one of ordinary skill in the art would expect such crosslinkers to work for the composition of Beck et al, motivated by expectation of success.

***Response to Arguments***

15. Applicant's arguments with respect to claims 10-18 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karuna P. Reddy whose telephone number is (571) 272-6566.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Karuna P Reddy
Examiner
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/KR/

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